IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re Application of: John W. Evans, et al.	)	Examiner:	N. Ogden
Serial No.: 10/629,642	)	Confirmation No.:	6851
Filing Date: July 29, 2003	)	Group Art Unit:	1751
For: Non-Aqueous Heat Transfer Fluid and Use Thereof	)	Docket No.:	97541.00022

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APPELLANT'S REPLY BRIEF

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I. STATUS OF THE CLAIMS

Claims 1-16, 18-42 and 45-48 are pending in the application.

Claims 17, 43 and 44 were cancelled during prosecution.

Claims 18-25 and 33-42 were withdrawn from consideration in response to a restriction requirement.

Claims 1-16, 26-32 and 45-48 stand rejected and are on appeal.

II. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Claims 7, 16 and 32 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

2. Claims 1-5, 8-12, 14, 26, 28-30, 45-46 and 48 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Reny, WO89/09806.

3. Claims 1-16, 26-32 and 45-48 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Coughenour, Chemical Abstracts 120:195478 or Dingley, Chemicals Abstracts 116:86516 or Evans, U.S. Patent No. 5,031,579 each in view of Mascioli, U.S. Patent No. 5,240,631, or Greaney, U.S. Patent No. 5,422,026.

4. Claims 1-5, 8-11, 13-14, 26-27, 29-32, 45 and 47-48 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Wood, U.S. Patent No. 4,455,248.

III. ARGUMENT

Rejection Under 35 U.S.C. § 112, First Paragraph

Claims 7, 16 and 32 stand rejected under 35 U.S.C. § 112, first paragraph as failing to comply with the written description requirement. In the Examiner's Answer, the Examiner states incorrectly that "[t]he aforementioned claims state that the propylene glycol is present in an amount greater than 98.5% by weight." In fact, claims 7, 16 and 32 on appeal each recite in part the following: "propylene glycol is present in a concentration of about 98.5% by weight, and said propylene glycol soluble additive comprises a mixture of about 0.5% sodium molybdate by weight, about 0.5% sodium nitrate by weight, and about 0.5% tolyltriazole by weight."

Contrary to the Examiner's assertion, the rejected claims recite that propylene glycol is present in an amount of **about 98.5% by weight**, not greater than 98.5%. The claims also recite that three specific additives are each present in an amount of about 0.5% by weight. This composition is a ***preferred embodiment*** described in the specification at page 17, line 20 to page 18, line 5 of the application as filed (paragraphs [0050] to [0051] 0f the published application. The specification states at page 17, lines 22-25 that sodium nitrate, tolyltriazole and sodium molybdate are required in an embodiment that would serve as a "world wide" coolant. At page 18, lines 2-5, the specification states: "In a preferred embodiment, ***each additive*** is present in a concentration of about 0.3% to about 0.5% by weight depending on the service life of the coolant." (emphasis added). Claims 7, 16 and 32 specifically recite one of these preferred embodiments having 0.5% by weight of the three additives required for a "world wide" coolant, which necessarily results in about 98.5% by weight propylene glycol. Clearly, claims 7, 16 and 32 are supported in the specification, and the description in the specification is more than

adequate to meet the written description requirement. Accordingly, the rejection of claims 7, 16 and 32 under 35 U.S.C. § 112, first paragraph should be reversed.

Rejection Under 35 U.S.C. §102(b) Based Upon Reny

Claims 1-5, 8-12, 14, 26, 28-30, 45-46 and 48 stand rejected under 35 U.S.C. §102(b) as anticipated by Reny, WO89/09806. To anticipate a claim under Section 102(b), a single prior art reference must disclose each and every element set forth in the claim. Apple Computer, Inc. v. Articulate Systems, Inc., 234 F.3d 14 (Fed. Cir. 2000); Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631 (Fed. Cir. 1987); MPEP § 2131. As discussed in detail in Appellant's Brief, Reny does not describe any composition that meets all of the limitations of the claims on appeal. Specifically, Reny does not teach or describe a non-aqueous heat transfer fluid comprising propylene glycol that contains less than 0.5% by weight water, and that contains no additives requiring the presence of water to dissolve the additive or to enable the additive to perform its intended function. To the contrary, all of the heat transfer fluids described by Reny that contain propylene glycol and additives contain phosphoric acid and at least 1% by weight water.

At page 4 of the Examiner's Answer, two sections of Reny are cited to support the Examiner's anticipation rejection. The Examiner first cites the paragraph at page 3, lines 1-11. This paragraph describes in general terms compositions comprising an alkylene glycol or a mixture of two or more alkylene glycols. In this passage, Reny does not describe ***any specific combinations of alkylene glycols***, and certainly does not describe the a composition comprising propylene glycol as recited in the claims on appeal. Therefore, this passage from Reny cannot anticipate the claims on appeal.

The Examiner also cites a portion of Reny at page 5, lines 28-34 which states that "[m]ost preferably, the alkylene glycol is used with essentially no water, i.e. less than about 1 weight percent." This sentence again refers generally to alkylene glycols and does not refer specifically to propylene glycol. In the only sentence in this paragraph that specifically refers to propylene glycol, Reny states that "Preferably less than about 5 percent and more preferably about 3 percent of water is dissolved in propylene glycol." Thus, the only ***specific*** teaching in Reny regarding propylene glycol based coolants is that they should contain added water.

This conclusion is further supported by the Examples on pages 9 and 10 of Reny. The examples which show propylene glycol coolants with less than 1 percent water are unbuffered and contain no corrosion inhibitors labeled as C_1 and C_2. As shown on page 10, the corrosion rates with fluid C_1 were very high and showed that the fluid was not acceptable. The Example identifying fluids of the invention of Reny, Examples 1 and 2, include a buffer and 1 part by weight added water.

At pages 8 and 10-11 of the Examiner's Answer, the Examiner states that the examples on page 9 of Reny show compositions having less than 1% water. This is incorrect. As explained above, the only compositions on page 10 of Reny that contain less than 1% water are controls that do not contain any corrosion inhibitor additives and displayed unacceptable corrosion rates for use as an engine coolant fluid. In fact, the examples on page 9 that describe Reny's composition contain a phosphoric acid buffer and 1% added water.

In sum, all of the discussion in Reny that relates specifically to propylene glycol based fluids teaches that added water is required. At page 11 of the Examiner's Answer, the Examiner states that "when the species is clearly named, the species claim is anticipated no matter how many other species are additionally named. Reny is actually exactly the converse of that

situation. The only references to fluids that may contain no added water refer to "alkylene glycols" in a general way and are not specific to propylene glycol. In addition, Reny states at page 5, lines 23-26 that phosphoric acid is added to maintain pH of the fluid, which necessarily requires added water. While Reny states that "some alkylene glycols" do not require the addition of phosphoric acid, Reny does not specify which alkylene glycols this may be, and Reny certainly does not state that propylene glycol is one of them. The general reference to "alkylene glycols" in insufficient to anticipate the claims on appeal, particularly where, as here, all of the propylene glycol based fluids actually described in Reny contain added water. Thus, in this case, in the only portions where the species (e.g. propylene glycol based fluids) is "clearly named," Reny teaches that added water is required. Accordingly, Reny does not anticipate the claims on appeal and the Examiner's rejection of claims 1-5, 8-12, 14, 26, 28-30, 45-46 and 48 under 35 U.S.C. §102(b) should be reversed.

Rejection Under 35 U.S.C. §103(a) Based Upon Coughenour, Dingley or Evans

Claims 1-16, 26-32 and 45-48 stand rejected under 35 U.S.C. § 103 based upon Coughenour, Dingley or Evans in view of each of Mascioli and Greaney. The Examiner agrees with the Appellant that Coughenour, Dingley and Evans do not describe non-aqueous coolants containing corrosion inhibitors such as molybdate, nitrate or an azole compound. The Examiner states in Table 3 of Example 1 of each of the secondary references, Mascioli and Greaney, the use of molybdate, nitrate and azole corrosion inhibitors in antifreeze concentrate compositions is described, and that it would be obvious to combine these three corrosion inhibitors as described in Mascioli and Greaney with the non-aqueous heat transfer fluids described in Coughenour, Dingley and Evans. To reach this conclusion, the Examiner has improperly failed to consider the teachings of Mascioli and Greaney in their entirety.

Mascioli describes alkylene glycol based antifreeze concentrates. The antifreeze concentrates described in Mascioli are diluted with water for use as heat transfer fluids. Accordingly, Mascioli does not describe a non-aqueous heat transfer fluid as recited in the claims on appeal.

Mascioli states that one problem with propylene glycol based coolant concentrates was oxidation of the propylene glycol, which Mascioli solves by addition of phosphorous acid. Col. 2, lines 19-27. In addition to phosphorous acid, Mascioli states that the antifreeze concentrates contain various "critical" additives requiring water to be present in the concentrate, including borate and silicate. Col. 2, lines 36-43. Also, Mascioli specifically states that "[t]he concentrate contains small amounts of water, usually 1 to 5% by weight water." Thus, Mascioli does not describe or suggest a non-aqueous antifreeze concentrate, much less a non-aqueous heat transfer fluid as recited in the claims on appeal.

The Examiner cites the composition described in the Example of Table 3 of Mascioli to support the rejection of the claims as obvious. In Table 3, Mascioli describes an antifreeze concentrate that contains, in part, propylene glycol, a molybdate, a nitrate and tolyltriazole. The Examiner ignores the fact that in this example, Mascioli states that 2% by weight water and several additives requiring the presence of water, including phosphorous acid, borate and silicate, are also present. The Examiner suggests that one skilled in the art would be motivated to pluck three specific additives listed in Table 3 of Mascioli, a molybdate, a nitrate and tolyltriazole, for a non-aqueous coolant, while not including the water and other additives listed in Table 3, including additives that Mascioli states are "critical" such as borates. Moreover, the Examiner suggests that one skilled in the art reading Mascioli would not include phosphorous acid, which Mascioli teaches is required to address oxidation of propylene glycol.

The Examiner has not identified any specific motivation or reason that one skilled in the art would selectively choose only some of the additives listed by Mascioli, while not including others, for use with the non-aqueous coolants described in Coughenour, Dingley and Evans with a reasonable expectation of success. In particular, there is no reason identified why one skilled in the art would select only a molybdate, a nitrate an azole from the composition described in Mascioli while excluding additives characterized as "critical." *See KSR International Co. v. Teleflex, Inc.,* 550 U.S. 398, 418 (2007)("[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant art to combine the elements in the way the claimed new invention does."). Accordingly, the Examiner's rejection of claims 1-16, 26-32 and 45-48 under 35 U.S.C. § 103 based upon Coughenour, Dingley or Evans in view of each of Mascioli should be reversed.

Greaney describes phosphate-free antifreeze concentrates. The antifreeze concentrates of Greaney also are used with added water in the cooling systems of internal combustion engines. Greaney states that the antifreeze concentrates contain "small but critical and effective amounts" of borate, sebacate and mercaptobenzothiazole. Col. 2, lines 26-32. Greaney specifically states that "[t]he concentrate contains small amounts of water, usually 1 to 5% by weight water." Col. 2, lines 48-50. Thus, Greaney does not describe or suggest a non-aqueous coolant composition at all.

In the Example in Table 3 of Greaney cited by the Examiner, Greaney describes an antifreeze coolant concentrate containing propylene glycol, 2 percent by weight water and several additives, including a molybdate, a nitrate and tolyltriazole. The composition described in Table 3 of Greaney also contains the "critical" components borate, sebacate and mercaptobenzothiazole provided in a 50% solution. The Examiner suggests that one skilled in

the art would be motivated to add only a molybdate, a nitrate and tolyltriazole described in Greaney to a non-aqueous propylene glycol coolant, while excluding water and other additives that Greaney describes as "critical" to the composition.

The Examiner does not explain why one skilled in the art would be motivated to take these three additives from the composition described in Table 3 of Greaney while not including the "critical" additives borate, sebacate and mercaptobenzothiazole which require added water with a reasonable expectation of success. Nor does the Examiner explain why one skilled in the art would have had a reasonable expectation of success in forming a non-aqueous heat transfer fluid using only selected additives described in Greaney while omitting other additives, including additives that are described as "critical" and the added water described by Greaney. *See KSR International Co. v. Teleflex, Inc.,* 550 U.S. 398, 418 (2007)("[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant art to combine the elements in the way the claimed new invention does."). Accordingly, the Examiner's rejection of claims 1-16, 26-32 and 45-48 under 35 U.S.C. § 103 based upon Coughenour, Dingley or Evans in view of Greaney is improper and should be reversed.

Rejection Under 35 U.S.C. §103(a) Based Upon Wood

Claims 1-16, 26-32 and 45-48 stand rejected under 35 U.S.C. § 103(a) based upon Wood. As set forth in detail in Appellant's Brief, Wood cannot be properly modified in a manner which results in the non-aqueous heat transfer fluid of the claims on appeal. The composition described by Wood "necessarily" contains sodium metasilicate. Col. 3, lines 27-55. As set forth in the evidence submitted by Appellant, there is no dispute that sodium metasilicate is insoluble in alcohols, and that added water is required to dissolve sodium metasilicate in an alcohol based coolant such as those recited in the claims on appeal. Indeed, in the only example of a fluid

provided by Wood, Example 1 at Col. 5, lines 9-37, an ethylene glycol based antifreeze concentrate is described containing 3.2% water, 0.16% sodium metasilicate, and several other additives.

The Examiner cites statements in Wood that "the antifreeze may be formulated as a concentrate using little or no water", (col. 3, lines 7-8). However, the requirement that the fluid described by Wood contain sodium metasilicate ***necessitates*** the addition of sufficient water for the sodium metasilicate to dissolve and remain in solution, i.e. in order for the sodium metasilicate to function, and the only actual example provided by Wood includes 3.2% by weight water.

Wood cannot be modified in a manner that would enable one skilled in the art to make and use the invention recited in the claims on appeal. "Although published subject matter is 'prior art' for all that it discloses, in order to render an invention unpatentable for obviousness, the prior art must enable a person of ordinary skill to make and use the invention. Thus when a *prima facie* case of obviousness is deemed made based on similarity to a known composition or device, rebuttal may take the form of evidence that the prior art does not enable the claimed subject matter." *In re Kumar*, 418 F.3d 1361, 1368 (Fed. Cir. 2005).

Wood states that the composition he describes ***necessarily*** contains sodium metasilicate. Appellant has provided substantial evidence supporting its position one skilled in the art reading Wood at the time that the present application was filed would understand that the composition described in Wood required added water. As described in the Declaration of John Evans dated March 5, 2007 at ¶ 4 (Evidence Appendix, Ex. 2), even in the concentrate form, it is necessary that the additives remain dissolved. Accordingly, to the extent that Wood suggests a concentrate

having sodium metasilicate and no added water, the concentrate is not even operative for its intended purpose of awaiting the addition of water for use as a heat transfer fluid.

The evidence set forth in the Evans Declaration is further supported by the independent evidence in the information sheet from the Occupational Safety & Health Administration (OSHA), (http://www.osha.gov/dts/chemicalsampling/data/CH_267715.html) (Evidence Appendix, Ex. 3) stating sodium metasilicate is not soluble in alcohols such as glycols, but is readily soluble in water.

In this case, the Applicant has presented unrebutted evidence that the composition described in Wood must contain added water. That evidence is further supported by the fact that the only example provided by Wood includes 3.2% by weight added water. There is no evidence that the composition described by Wood, which ***necessarily*** contains sodium metasilicate can be formulated without the addition of water. The Examiner has failed to meaningfully consider the evidence submitted by the applicant rebutting the Examiner's obviousness conclusion. *In re Sullivan*, 498 F.3d 1345 (Fed. Cir. 2007)(rebuttal evidence submitted in response to *prima facie* obviousness rejection must receive meaningful consideration). Accordingly, Wood does not enable a non-aqueous heat transfer fluid as recited in the claims on appeal, and the rejection of claims 1-16, 26-32 and 45-48 under 35 U.S.C. § 103(a) based upon Wood should be reversed.

CONCLUSION

For the reasons set forth above, and the reasons previously set forth in Appellant's Brief, reversal of the rejection of claims 1-16, 26-32 and 45-48 is warranted, and such action is earnestly solicited.

A Request for Oral hearing and the $540 fee and the associated fee have been submitted herewith. No additional fee is believed to be required. However, if any additional fee is

required, or otherwise if necessary to cover any deficiency in fees already paid, authorization is hereby given to charge any required fees to Deposit Account No. 50-3569; further, if any extension of time is required, please consider this a petition therefor, and authorization is hereby given to charge the associated extension fee to Deposit Account No. 50-3569.

Respectfully submitted

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